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EXAMINER	
BODDIE, WILLIAM	

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/691,461
Filing Date: October 22, 2003
Appellant(s): SUZUKI ET AL.

B. Joe Kim
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed August 9th, 2010 appealing from the Office action mailed February 17th, 2010.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application: claims 20-23.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the

subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

US 6,370,017	Nakabayashi et al.	4-2002
US 6,791,566	Kuratomi et al.	9-2004

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 20-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakabayashi et al. (US 6,379,017) in view of Kuratomi et al. (US 6,791,566).

With respect to claim 20, Nakabayashi discloses, a liquid crystal display device (col. 1, lines 27-31) comprising:

a liquid crystal display panel (col. 4, lines 62-65, for example);

a light source device for illuminating the liquid crystal display panel and having first and second light sources (211, 212 in fig. 23c) and a light guide plate (203 in fig. 23c),

wherein the light guide plate has a planar light exit surface provided in the liquid crystal display panel side (321-322 in fig. 23c), a curved (131 in fig. 14; col. 13, lines 4-6) reflecting surface that is opposite to the light exit surface (311-312 in fig. 23c; 131 in fig. 14) and that is formed so that a thickness of the light guide plate is smaller at both side end faces and becomes greater in a central part thereof (fig. 23c)

the first light source is provided in neighborhood of the one side end face of the light guide plate (side end face of right 203 in fig. 23c); and

the second source is provided in neighborhood of the other side end face of the light guide plate (side end face of left 203 in fig. 23c); and

the curved (131 in fig. 14; col. 13, lines 4-6) reflecting surface is formed so that a light incident form the one side end face is reflected totally on the curved reflecting surface of a neighborhood of the first light source and a light incident from the other side end face is reflected totally on the curved reflecting surface of a neighborhood of the second light source (col. 22, lines 21-37; discloses, that the top plate 311-312 reflects the light to be output at the bottom faces 321-322).

As described above, the figure 23c grooves in figure 23c are seen as replaceable with the figure 14 curved reflecting surface. This replacement is seen as both suggested (increased uniform illumination; col. 13, lines 10-15) and likely to be successful due to the very similar manner of operation between the two embodiments.

Nakabayashi does not expressly disclose a driving circuit nor a light scattering element formed on the reflecting surface.

Kuratomi discloses a liquid crystal display device (fig. 32) comprising:

a driving circuit (1903 in fig. 32) for supplying a predetermined drive signal to the liquid crystal display panel (1901 in fig. 32), and

a light scattering element formed on the reflecting surface (16 in figs. 2-3), and

a light source device for illuminating a liquid crystal display panel form a back side thereof (fig. 32).

Nakabayashi and Kuratomi are analogous art because they are both from the same field of endeavor namely backlight design for LCDs.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the driving circuit and light scattering layer of Kuratomi in the display of Nakabayashi for the benefit of producing the necessary signals to display ordinary NTSC signals on the display (Kuratomi; col. 2, lines 18-23).

With respect to claim 21, Nakabayashi and Kuratomi disclose a liquid crystal display device according to claim 20 (see above).

Nakabayashi does not expressly disclose the light-scattering element is formed by using screen printing.

Kuratomi discloses wherein a light-scattering element has a scattering layer (16 in figs. 2-3) formed by using screen printing (col. 8, lines 60-65).

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the create the light-scattering element of Kuratomi via the screen

printing method taught by Kuratomi for the benefit of producing a desired luminance gradient (Kuratomi; col. 9, lines 1-3).

With respect to claims 22-23, Nakabayashi and Kuratomi disclose a liquid crystal display device according to claims 20 and 21 (see above).

Nakabayashi further discloses, wherein the light guide plate has a first lighting element for taking out light guided from the side of the first light source and which includes the light-scattering element (311 in fig. 23c) and a second lighting element for taking out light guided from the side of the second light source and which includes the light-scattering element (312 in fig. 23c);

the first lighting element is provided in an area other than the neighborhood of the first light source (211 in fig. 23c) and takes out light guided from the side of the first light source with higher efficiency as the distance to the second light source is smaller (col. 22, lines 21-37; discloses, that the top plate 311-312 reflects the light to be output at the bottom faces 321-322); and

the second lighting element (212 in fig. 23c) is provided in an area other than the neighborhood of the second light source and takes out light guided from the side of the second light source with higher efficiency as the distance to the first light source is smaller (col. 22, lines 21-37; discloses, that the top plate 311-312 reflects the light to be output at the bottom faces 321-322).

With respect to claim 24, Nakabayashi discloses, a liquid crystal display device (col. 1, lines 27-31) comprising:

a liquid crystal display panel (col. 4, lines 62-65, for example);

a light source device for illuminating the liquid crystal display panel and having first and second light sources (211, 212 in fig. 23c) and a light guide plate (203 in fig. 23c),

wherein the light guide plate has a planar light exit surface provided in the liquid crystal display panel side (321-322 in fig. 23c), a wedge-like (each 203 in fig. 23c is seen as encompassing the broadest reasonable interpretation of "wedge-like") reflecting surface that is opposite to the light exit surface (311-312 in fig. 23c; 131 in fig. 14) and formed so that thickness of the light guide plate is smaller at both end faces and becomes greater in a central part thereof (fig. 23c), the reflecting surface being planar from each end faces to the central part (fig. 23c) and having prism-like features formed on the reflecting surface at predetermined angles (204 in fig. 23c)

the first light source is provided in neighborhood of the one side end face of the light guide plate (side end face of right 203 in fig. 23c); and

the second source is provided in neighborhood of the other side end face of the light guide plate (side end face of left 203 in fig. 23c).

Nakabayashi does not expressly disclose a driving circuit.

Kuratomi discloses a liquid crystal display device (fig. 32) comprising:

a driving circuit (1903 in fig. 32) for supplying a predetermined drive signal to the liquid crystal display panel (1901 in fig. 32), and

a light scattering element formed on the reflecting surface (16 in figs. 2-3), and

a light source device for illuminating a liquid crystal display panel form a back side thereof (fig. 32).

Nakabayashi and Kuratomi are analogous art because they are both from the same field of endeavor namely backlight design for LCDs.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the driving circuit Kuratomi in the display of Nakabayashi for the benefit of producing the necessary signals to display ordinary NTSC signals on the display (Kuratomi; col. 2, lines 18-23).

With respect to claim 25, Nakabayashi discloses, a liquid crystal display device (col. 1, lines 27-31) comprising:

a liquid crystal display panel (col. 4, lines 62-65, for example);

a light source device for illuminating the liquid crystal display panel and having first and second light sources (211, 212 in fig. 23c) and a light guide plate (203 in fig. 23c),

wherein the light guide plate has a planar light exit surface provided in the liquid crystal display panel side (321-322 in fig. 23c), a wedge-like (each 203 in fig. 23c is seen as encompassing the broadest reasonable interpretation of "wedge-like") reflecting surface that is opposite to the light exit surface (311-312 in fig. 23c; 131 in fig. 14) and that is formed so that thickness of the light guide plate is smaller at both end faces and becomes greater in a central part thereof (fig. 23c), the reflecting surface being planar from each end faces to the central part (fig. 23c)

the first light source is provided in neighborhood of the one side end face of the light guide plate (side end face of right 203 in fig. 23c); and

the second source is provided in neighborhood of the other side end face of the light guide plate (side end face of left 203 in fig. 23c).

Nakabayashi does not expressly disclose a driving circuit nor a light scattering element formed on the reflecting surface.

Kuratomi discloses a liquid crystal display device (fig. 32) comprising:

a driving circuit (1903 in fig. 32) for supplying a predetermined drive signal to the liquid crystal display panel (1901 in fig. 32), and

a light scattering element formed on the reflecting surface (16 in figs. 2-3), and

a light source device for illuminating a liquid crystal display panel form a back side thereof (fig. 32).

Nakabayashi and Kuratomi are analogous art because they are both from the same field of endeavor namely backlight design for LCDs.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the driving circuit and light scattering layer of Kuratomi in the display of Nakabayashi for the benefit of producing the necessary signals to display ordinary NTSC signals on the display (Kuratomi; col. 2, lines 18-23).

(10) Response to Argument

1. In section I.A of the Applicants' brief it is argued that the figure 14 embodiment of the Nakabayashi reference fails to disclose totally reflecting light on the curved reflecting surface.

Nakabayashi is replete with discussion of total reflection of light rays throughout the specification. The most pertinent discussion of total reflection is concerning the particulars of total reflection of incident light in the second embodiment (col. 12, lines 26-29). Figure 14, admitted by the Applicants in the footnote on page 11 of the Appeal Brief to be an aspect of the figure 5 embodiment, states that "although the groove has been formed stepwise in the second embodiment, the groove may also be an arbitrary curve as shown in fig. 14" (col. 13, lines 4-6). Thus Nakabayashi has expressly demonstrated the interchangeability of stepwise and curved surfaces to effectuate total reflection.

Additionally, if the light emitted by the light in figure 14, were not totally reflected it would result in a very lossy and non-uniform backlight unsuitable for the purposes and advantages proffered by Nakabayashi (col. 12, lines 23-29). Furthermore total reflection seems to be a main tenet of all of the light guides disclosed by Nakabayashi as demonstrated by the abstract language of Nakabayashi.

Based on these facts it seems clear to the Examiner that the figure 14 embodiment of Nakabayashi does in fact totally reflect light rays emitted from one side end face.

The Applicants' also argue that the reflecting plate, 4 in fig. 14, is evidence that the light rays are not totally reflected. Arguing that if light is supposed to exit out through the curved surface, it can not be argued that the light is also totally reflected.

For such an argument to hold water, figure 5 must also be incapable of totally reflecting light. This is completely contrary to the portions of Nakabayashi which state

that figure 5 light rays are totally reflected despite light being emitted back through the stepwise slopes (for example, col. 11, lines 62-65; col. 12, lines 16-17, 27-29, 53-55).

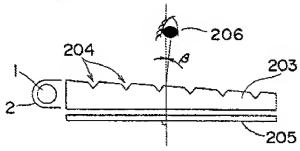
As best understood by the Examiner, total reflection occurs when a ray of light strikes a medium boundary at an angle larger than a particular critical angle with respect to normal of the medium boundary. In other words, total reflection does not require reflection of a light ray under all circumstances. As shown above, the figure 14 shape will totally reflect light incident from one side end face as required by the claim language. The light reflected by the reflecting plate, 4, of Nakabayashi will *not* be "incident from the one side end face" and as such need not be totally reflected by the curved surface to satisfy the claim limitations.

As shown above, Nakabayashi's figure 14 disclosure will totally reflect light incident from one side end face.

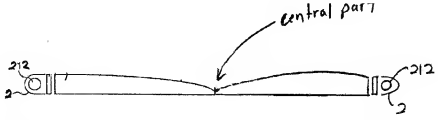
2. In section I.B of the Applicants' brief, the Applicants' argue that the combination of figure 14 with that of figure 23C would result in a combined light guide which does not disclose the limitation requiring that the middle of the light be thicker than both ends.

Figures 23 A through C are examples of proposed modifications of the third embodiment disclosed in figure 19. A review of figure 19, shown below, reveals a light guide which is thicker at the light source and thinner as it extends from the light source. This gradual thinness is in the same direction as the gradual sloping in figure 14 of Nakabayashi.

Fig. 19

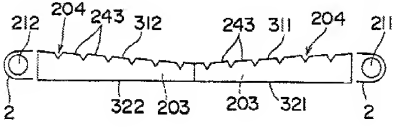


Figures 23A-C each contemplates a manner of introducing an additional light source. The Applicants argue that combining figure 23C and figure 14 will result in the below picture.



However, the Applicants' argued combination looks very similar to figure 23B, shown below.

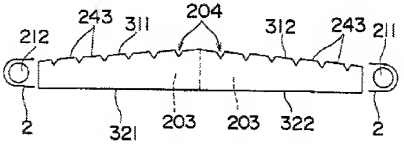
Fig. 23B



The Examiner agrees that the proposed combination of figure 23B and figure 14 would likely result in the arrangement argued by the Applicants. However, that is not

the proposed combination. Rather it is figure 23C, which joins the thicker two ends together as shown below, that is contemplated to be combined with figure 14.

Fig. 23C



With such a starting point the arrived upon combination would clearly seem to arrive at a light guide similar to the Applicants own and result in an arrangement similar to the one shown below.

Just as in figure 23C the thicker ends of the original light guide have been joined to form a single larger light guide. Such an arrangement is seen as clearly fulfilling the claim limitations which require a thicker central area with thinner edges.

3. Turning to section II.A of the Applicants' appeal brief, the Applicants also argue that "one of ordinary skill in the art working with the transmissive liquid crystal display device which entirely dispenses or omits the use of a reflection plate would not have looked to the teaching of Nakabayashi which requires the use of a reflection plate."

In response, the Examiner argues that nowhere in the claims is a specifically transmissive liquid crystal display required nor is there any limitation disallowing the use of a reflecting plate. Nakabayashi is certainly analogous art to the present invention, as both deal with liquid crystal display backlight light guide design. To argue that the proper analogy is to transmissive liquid crystal displays is seen as unduly narrow. Furthermore such a analogy is not commiserate with the Applicants' own described field of invention on page 1 of the specification which states the invention relates to "a light source device utilizing an array of discrete light sources and a display having the same."

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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/Sumati Lefkowitz/
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